Name: Date:

Polynomial Factoring solution (version 672)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 2x + 13 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-2) \pm \sqrt{(-2)^2 - 4(1)(13)}}{2(1)}$$

$$x = \frac{-(-2) \pm \sqrt{4 - 52}}{2(1)}$$

$$x = \frac{2 \pm \sqrt{-48}}{2}$$

$$x = \frac{2 \pm \sqrt{-16 \cdot 3}}{2}$$

$$x = \frac{2 \pm 4\sqrt{3}\,i}{2}$$

$$x = 1 \pm 2\sqrt{3}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-9 - 8i$ and $5 - 2i$ in standard form $(a + bi)$.**

Solution

$$(-9 - 8i) \cdot (5 - 2i)$$

$$-45 + 18i - 40i + 16i^2$$

$$-45 + 18i - 40i - 16$$

$$-45 - 16 + 18i - 40i$$

$$-61 - 22i$$

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3. **Write function $f(x) = x^3 + 8x^2 + 9x - 18$ in factored form. I'll give you a hint: one factor is $(x + 3)$.**

Solution

	1	8	9	-18
-3		-3	-15	18
	1	5	-6	0

$$f(x) = (x+3)(x^2+5x-6)$$

$$f(x) = (x+3)(x-1)(x+6)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7)\cdot(x+2)^2\cdot(x-2)^2$$

Sketch a graph of polynomial $y = p(x)$.